

Notice

Environmental Protection Act 1994

Notice to conduct or commission an environmental investigation

This notice to conduct or commission an environmental investigation is issued by the administering authority pursuant to section 326B of the Environmental Protection Act 1994.

Copper Refineries Pty Ltd, ACN: 009 676 975
Gateway Level 44, 1 Macquarie Place
SYDNEY NSW 2000

Our reference: C-CPLPO-100330927, STAT-E-100446071

Friday, 26 April 2024

Attention: Mr Paul Taylor

Take notice: that under the *Environmental Protection Act 1994* (the Act) a notice to conduct or commission an environmental investigation is issued to Copper Refineries Pty Ltd (you) by the administering authority. The administering authority is the Chief Executive of the Department of Environment, Science and Innovation (the department).

The notice to conduct or commission an environmental investigation is issued in respect of the activities of Copper Refineries Pty Ltd on land described as Lot 1 on RP717218, Lot 1 on SP273456, Lot 9 on SP186988, Lot 3 on SP162416, Lot 2 on SP272203, Lot 3 on SP272203 and Lot 4 on SP272203 (the premises).

A. Grounds

The notice to conduct or commission an environmental investigation is issued on the following grounds:

1. Pursuant to section 326B(1)(b) of the Act, the department is satisfied on reasonable grounds that you are undertaking an activity, that is causing, or is likely to cause environmental harm.

The facts and circumstances forming the basis for these grounds are:

1. Copper Refineries Pty Ltd (CRL) own and operate the Townsville Copper Refinery situated at 100 Hunter Street, STUART, QLD 4811 (the premises).
2. CRL is the holder of environmental authority EPPR00416313 (the EA) which authorises environmentally relevant activities (ERA) 8 – chemical storage, ERA 15 – fuel burning, ERA 19 – metal forming, ERA 29 – metal foundry operation, and ERA 38 – surface coating to be carried out at the premises, subject to conditions.
3. On 31 October 2020, CRL submitted a Program Notice of a relevant event (Transitional Environmental Program) (the program notice) under section 350 of the Act, for the release of contaminants to surface water, groundwater and land caused by degraded stormwater pipes and containment infrastructure at the premises.



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4. The program notice was accompanied by a series of groundwater and surface water assessment reports that described actual, and potential sources of contaminants to surface water, groundwater and land associated with CRL's activity at the premises.
5. Contaminants that are, or could potentially be released to the receiving environment, from carrying out the activity, include copper, nickel, lead, arsenic, zinc, silver, acidity, sulfate, ammonium and nitrate.
6. These contaminants are causing, or are likely to cause environmental harm, as demonstrated by the issue of a Transitional Environmental Program MAN-E-100069404, amended to MAN-E-100487158 (the TEP), and further detailed below.
7. The premises lie within the Stuart Creek and Sandfly Creek catchments of the Ross River Basin, in the Townsville State Development Area (TSDA).
8. The **environmental values (EVs)** and **water quality objectives (WQOs)** for waters in the Ross River Basin are documented in the *Ross River Basin and Magnetic Island Environmental Values and Water Quality Objectives Basin No. 118 including all waters of the Ross River Basin, and adjacent coastal waters (including Magnetic Island)* (EHP, 2013), which is listed under schedule 1 of the **Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (EPP (Water))**.
9. The Ross River Basin waters relevant to CRL's activities are indicated in the listed Plan WQ1181—Ross River Basin mainland surface waters, Plan WQ1183—coastal waters and Plan WQ1184—groundwaters.

Stormwater Quality

10. Stormwater discharges from the premises to the receiving environments of Vantassel Creek via the Highway West Drain (HWD), and to Sandfly Creek via the Highway East Drain (HED).
11. CRL are required to monitor the flows and quality of stormwater discharges from the HED and HWD at monitoring points W1 and W2, in accordance with conditions C3 and C4 of the EA.
12. The EA does not stipulate any authorised contaminant release to **receiving waters** from the premises.
13. The program notice submitted by CRL stated that there were "*Elevated contaminant levels in water released from site discharge points (Highway East Drain and Highway West Drain)*".
14. The surface water and sediment monitoring (2018-2020) report (AECOM 2020) submitted with the program notice states that:
 - a. Concentrations of antimony, arsenic, cadmium, copper, lead, nickel, silver and zinc in the receiving environment downstream of the HED and HWD, were consistently elevated above the scheduled default guideline values (ANZG 2018) and background site thresholds (SW8, VCB01, VCB03).
 - b. Concentrations of these heavy metals were greatest at the downstream sites closest to the HED (HED1A, HED60) and HWD (HWD7), copper being the main contaminant.
15. The surface water **EVs** relevant to CRL's activities at the premises include aquatic ecosystems, irrigation, stock water, visual recreation, industrial use, and cultural and spiritual values.
16. The surface water improvement project (Phase 1 & Phase 2) reports (AECOM 2020) submitted with the program notice identified:

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- a) Surface water contamination risk is widespread throughout most of the operational catchment due to historical and current activities;
 - b) Thirty-three (33) potential contaminant sources on the premises, the highest risk areas being the EPP area, Casting House, Tank House, BOSH Pond and open storage areas; and
 - c) The site's water management system is insufficient to reduce potential contaminant loads in stormwater discharges.
17. Under the **EPP (Water)**, surface waters within the TSDA have been mapped as 'moderately disturbed' with a management intent to either maintain or improve water quality to meet the scheduled **WQOs**.
18. The observed concentrations of contaminants in waters and sediments downstream of the HED and HWD indicate that the **EVs** of the **receiving waters** are not being protected based on exceedances of the **WQOs**, likely due to contaminants released from the premises. As such, improvements may be required with regard to site water management and the quality of stormwater releases.

Groundwater

19. The mobilisation of contaminants (ammonium sulphate, arsenic, copper, nickel) from the former evaporation ponds has impacted the groundwater system in the western/northwestern section of the premises.
20. Condition C1 of the EA requires CRL to pump out contaminated groundwater from an interception trench (monitoring point W4 within *Schedule C - Table 1 (Monitoring Frequency)* of the EA) to minimise discharge into Stuart Creek during dry weather conditions.
21. In addition, CRL were previously required to develop a Remediation Action Plan (RAP) for the former evaporation ponds and the underlying contaminated groundwater, which included a long-term groundwater and surface water monitoring program to determine the outcome of remediation works.
22. The program notice stated that "*Elevated contaminant levels have been observed in groundwater and sediment results in monitoring bores located in close proximity to the north side of the Tankhouse*" (i.e., on-site area).
23. The groundwater **EVs** relevant to CRL's activities at the premises include aquatic ecosystems, irrigation, farm supply, stock water, aquaculture, drinking water and cultural and spiritual values.
24. The Annual Groundwater Monitoring Reports (AGMR) (AGE 2018, 2019, 2020, 2021) submitted by CRL identified:
- (a) Aging infrastructure and/or operations are potential point sources for the release of contaminants to groundwater, either via seepage or the mobilisation of relict solutes.
 - (b) The quality of the groundwater exceeds the local **WQOs** scheduled under the **EPP (Water)** for groundwaters within the low salinity coastal floodplains (Zone 9) of the Ross River Basin (Plan WQ1184).
 - (c) There is the potential for mobilisation of contaminants and subsequent discharge of contaminated groundwater off-site. This includes sulfate and nitrate, which are unlikely to attenuate downgradient.
25. Under the **EPP (Water)**, groundwaters have high ecological value (HEV) for aquatic ecosystems, and groundwater quality should not compromise identified **EVs** and **WQOs** for those waters where groundwater(s) interact with surface waters (e.g., Stuart Creek).

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Land disposal of wastewater

26. Condition D3 of the EA states that the release of wastewaters to land must be “...in accordance with sustainable irrigation practices, monitoring requirements and release criteria prescribed in Section 4.2, Paper 4, Volume 1 of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000”.
27. The **EPP (Water)** includes **WQOs** for heavy metals and metalloids in agricultural irrigation water which are based on long-term trigger values (LTVs) and short-term trigger values (STVs) in the Australian and New Zealand Environment and Conservation Council & Agriculture and Resource Management Council of Australia and New Zealand (ANZECC & ARMCANZ, 2000) water quality guidelines for irrigation.
28. The contaminant release limits specified in *Schedule D - Table 1 (Release limits – Land)* of the EA are based on STVs, which “is the maximum concentration (mg/L) of contaminant in the irrigation water which can be tolerated for a shorter period of time (20 years) assuming the same maximum annual irrigation loading to soil as LTV” (i.e. 100 years).
29. The irrigation of wastewaters to land has been occurring at the premises for more than 20 years, and the department understands that CRL intend to continue this practice as a critical component of the site’s water management systems. As such, it is unclear if the continued application of STVs for the irrigation of wastewaters is appropriate or sustainable.
30. The department’s [Disposal of effluent using irrigation, Technical Guideline](#) (2020) defines the disposal of effluent to land as “the application of treated wastewater to land such that it does not adversely impact (cause “environmental harm”) on the environment now or into the future”.
31. Poorly planned and managed effluent irrigation schemes can result in significant environmental degradation. Potential adverse environmental impacts include the following:
 - (a) Loss of soil ecosystems;
 - (b) Increased soil salinity and sodicity;
 - (c) Degradation of soil structure;
 - (d) Accumulation of toxicants in the soil profile;
 - (e) Environmental nuisance to neighbours from odours and insects;
 - (f) Adverse impacts on waterways from runoff or overflows from storages; or
 - (g) Adverse impacts on groundwater from leaching of contaminants.

B. Requirements

1. You must conduct or commission an environmental investigation and provide an environmental report.
2. The environmental report must be prepared by an **appropriately qualified person** and submitted to the department on or before **27 July 2026**.
3. The environmental report must address the following matters:
 - a. Identify the spatial location, relationships and characteristics of the hydrological features relevant to the premises including:

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- i. Individual catchments, operational sub-catchments and flow paths for surface flows leaving the premises;
 - ii. Potential and/or actual interaction(s) between groundwaters and surface waters (including but not necessarily limited to groundwater recharge and/or surface expression);
 - iii. **Environmental values (EVs)** within, or dependant on the identified hydrological features, in accordance with the **EPP (Water)**.
 - iv. The relationship with current and historical site-related infrastructure/storage; and
- b. Identify all contaminant sources at the premises (e.g., nutrients, metals, salts, hydrocarbons, acidity) with the potential to cause environmental harm.
 - c. Identify and describe all actual and potential pathways and mechanisms for the release and transport of contaminants from the sources identified in requirement 3b to the receiving environment, either directly or indirectly.

Surface waters

- d. Assess and characterise the quantity and quality of surface flows from each of the operational sub-catchments identified in requirement 3a, including the effectiveness of any current water treatment and management systems.
- e. Assess the quantity and quality of the surface waters released to the **receiving waters** via the HED, HWD and any other identified pathways, and the potential for environmental harm.
- f. Assessments associated with requirements 3d and 3e must:
 - i. Consider temporal variability over the range of flow conditions experienced within **receiving waters** (i.e., low-flow to high-flow events of varying duration);
 - ii. Ensure that sampling is undertaken in accordance with appropriate standards and guidelines including, but not limited to the most recent version of Queensland's Monitoring and Sampling Manual;
 - iii. Include details of sampling methodology, including sampling locations and rationale for their selection;
 - iv. Include accurate positioning data (e.g., using a Global Positioning System (GPS)) and provide an appropriately scaled map(s) displaying sample locations;
 - v. Include tabulated analytical and Quality Assurance/Quality Control (QA/QC) results of all monitoring and sampling activities, and provide the full dataset in the form of an editable Microsoft Excel file;
 - vi. Ensure that the analytical suite includes (as a minimum) the following parameters: ammonia, antimony, arsenic, cadmium, cobalt, copper, electrical conductivity, lead, nickel, nitrate, pH, silver, sulfate and zinc; and
 - vii. Ensure that all laboratory analysis is undertaken by a laboratory with National Association of Testing Authorities (NATA) accreditation for the test conducted. Original certificates of analysis (COA) must be made available on request.

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- g. Compare the quality of the surface waters and sediment in the receiving environment downstream of the HED and HWD with the relevant **WQOs** scheduled under the **EPP (Water)** (Table 2a).
- h. Identify options, including any operational measures or treatment for reducing the concentration of contaminants potentially released from the premises, to ensure **WQOs** are achieved within the **receiving waters**. This options analysis should include a quantitative assessment of the potential performance of the contaminant reduction options identified.
- i. If the options analysis undertaken identifies that the release of contaminants from the premises is necessary, derive site-specific contaminant limits for surface water discharges from the premises, that will ensure the protection of all scheduled **EVs** of the **receiving waters**.

Groundwaters

- j. Assess the quality of groundwaters at the premises, and the potential for environmental harm, in accordance with the department's Guideline '[Using monitoring data to assess groundwater quality and potential environmental impacts](#), Version 2, February 2021'. The assessment should further investigate the groundwater observations identified in the Annual Groundwater Monitoring Reports (AGMR) (AGE 2020, 2021) and any subsequent monitoring reports, including:
 - i. The potential for stormwater seepage to influence groundwater salinity to the north of the Tank House (as identified at groundwater bore MB61);
 - ii. The potential for sulfate attenuation in groundwaters north of the Former Rod Mill/Wire Manufacturing facility;
 - iii. Elevated concentrations of nitrate adjacent to the Northern Effluent Dam and AMSUL Dam;
 - iv. Elevated concentrations of ammonia adjacent to the Northern and Western effluent dams;
 - v. Groundwater mounding adjacent to the northern side of the Tank House (at groundwater bores TH3 and TH4) and the Slimes and Electrolyte Storage Areas;
 - vi. Persistent low pH adjacent to the southwest portion of the EPP area;
 - vii. Potential recharge from the HED; and
 - viii. The extent of contaminant migration in the RAP management area and potential to impact on the scheduled EVs of Stuart Creek, with consideration of the following conclusions and/or assumptions made by the AGMR reports (AGE 2020, 2021):
 - Increased sulfate in Stuart Creek is localised and being mitigated further downstream by freshwater inflows despite sulfate being transported to the distal portion of the RAP management area;
 - Elevated nitrate concentrations in Stuart Creek are not influenced by the elevated levels of nitrate in groundwater beneath the RAP management area;
 - Relict solutes are "*likely being intercepted*" between the former evaporation ponds and Stuart Creek;

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- Groundwater discharge may have been occurring in 2021 depending on the water level in Stuart Creek;
 - Groundwater discharge into Stuart Creek would likely cause environmental harm if the production bores PB2R, PB11 and PB12 were not operating at the intended rate (or greater) for the cone of depression to be maintained, and prevent further migration of contaminated groundwater in the RAP management area;
 - The risk from increasing ammonium concentrations downgradient of the former evaporation ponds (MB40a) if production bore PB2R was not operating as intended; and
 - Increasing concentrations of copper and nickel are being detected in the deeper portion of the groundwater system.
- k. Compare the quality of the groundwater at the premises with the **WQOs** scheduled under the **EPP (Water)** for groundwaters within the low salinity coastal floodplains (Zone 9) of the Ross River Basin (Table 14, Plan WQ1184).
- l. Identify and evaluate options for further improving groundwater quality at the premises. This should include but not necessarily be limited to:
- i. Specific measures to reduce the likelihood of sulfate and nitrate migration to the **receiving environment**, including measures to ensure production bores PB2R, PB11 and PB12 are operating at the intended rate (or greater), and any contingency measures or controls for maintaining the cone of depression in the RAP management area.
 - ii. Assessment of the effectiveness of remedial actions conducted to reduce contaminant loads to groundwaters, including the actions of the TEP and the former RAP. For example:
 - Relining of stormwater network in the SX Plant and EPP area.
 - Relining of the Krupps Ponds and AMSUL Dam.
 - Phytoremediation and capping of the former evaporation ponds.

Land disposal

- m. Undertake a detailed assessment of the current land disposal system at the premises for the release of wastewaters from metal processing operations. The assessment should be undertaken in accordance with the department's guideline [Disposal of effluent using irrigation, Technical Guideline](#), and at a minimum, include:
- i. The quantity and quality of the irrigated effluent released to date (where records are available or reasonable estimates can be made) along with projected future releases;
 - ii. The location and methodology of wastewater irrigation to land;
 - iii. The suitability of land utilised for irrigation of wastewaters of the above determined quantity and quality (considering soil type, climate, groundwater table, flooding, land use and available surface area);

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- iv. Horizontal proximity to and connection (i.e., flow paths) to surface waters and groundwater;
 - v. Proximity to sensitive environmental receptors (e.g., matters of state environmental significance, shallow groundwater);
 - vi. Groundwater flow, velocity and direction within the irrigation area;
 - vii. The process for managing wastewater when water quality in the Main Irrigation Dam (MID) does not meet the criteria for the release to land (Schedule D – Table 1 of the EA), or there is a risk of surface runoff and/or ponding;
 - viii. A storage water balance and the reuse efficiency based on the following components:
 - Storage options available at the premises, including volumetric capacity;
 - Total inflow volume associated with each storage option (e.g., effluent inflow and rainfall inputs); and
 - Outflow associated with each storage option (e.g., evaporation, overflow and or seepage);
 - ix. A soil water balance to determine the fate of disposed effluent to land;
 - x. Any relevant sampling or monitoring data (e.g., soils, surface water and groundwater);
 - xi. The potential for offsite movement of contaminants in wastewaters (as surface runoff and/or deep drainage into groundwater);
 - xii. The potential long-term impacts to the soil environment in relation to land sustainability, soil ecosystems and potential land contamination; and
 - xiii. The **EVs** likely to have been/may be impacted by the release of wastewater to land and waters (including the aquatic ecosystems of Stuart Creek, stock watering and irrigation).
- n. Compare the quality of the wastewater discharges with the **WQOs** (LTVs and STVs) scheduled under the **EPP (Water)** for heavy metals and metalloids in agricultural irrigation water (Table 9), making reference to the ANZECC & ARMCANZ (2000) water quality guidelines for irrigation.
 - o. Assess the potential impacts of continuing irrigation based on the STVs for heavy metals and metalloids.
 - p. Assess the potential impacts on the water quality in the MID from any expected increase in contaminant inputs to the MID (e.g. pumping from production bore PB3).
 - q. Identify options, including any operational measures for improving wastewater quality (e.g., reuse of processing water), and provide detailed comment on their specific impact to achieving sustainable effluent irrigation for land disposal.
 - r. Review and identify any required changes to the EA, CRL's Environmental Management Program (EMP) and management plans or procedures, and timeframes for implementation. For example:
 - i. *CRL stormwater management (PRO-616212)*
 - ii. *Irrigation Dam (PRO-616213)*
 - iii. *Rain Action Response (PRO-616214)*

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iv. Waste management (PRO-616223)

Take notice:

1. The requirements of this notice to conduct or commission an environmental investigation take effect immediately upon service of this notice.
2. This notice remains in force until further notice from the department.
3. You are responsible for meeting the costs of conducting or commissioning the environmental investigation, preparing the report, and providing any further information as requested by the department.

Environmental Report submission requirements

- As the **recipient** of this notice, you are required to provide a declaration to accompany the environmental report submitted to the department.

The recipient declaration template and the information required to complete the declaration is available at [Compliance guidelines | Environment | Department of Environment and Science, Queensland \(des.qld.gov.au\)](https://des.qld.gov.au/Compliance-guidelines/Environment/Department-of-Environment-and-Science-Queensland)

DEFINITIONS:

“Appropriately qualified person” means a person or persons who has professional qualifications, training, skills and experience relevant to the nominated subject matter and can give authoritative assessment, advice and analysis of performance in relation to the subject matter using the relevant protocols, standards, methods or literature.

“Environmental values (EVs)” means the EVs specified in Table 1 of the *Ross River Basin and Magnetic Island Environmental Vales and Water Quality Objectives Basin No. 118 including all waters of the Ross River Basin, and adjacent coastal waters (including Magnetic island)*, for the corresponding water.

“Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (EPP (water))” means the *Environmental Protection (Water and Wetland Biodiversity) Policy 2019 - Ross River Basin and Magnetic Island Environmental Vales and Water Quality Objectives Basin No. 118 including all waters of the Ross River Basin, and adjacent coastal waters (including Magnetic island)*.

“Receiving waters” includes all or any part of a river, stream, lake, lagoon, pond, swamp, wetland, unconfined surface water, unconfined water in natural or artificial watercourses, bed and banks of a watercourse, dams, non-tidal or tidal waters (including the sea), stormwater channel, stormwater drain, roadside gutter, stormwater run-off, and groundwater.

“Water quality objectives (WQOs)” means the WQOs specified in Table 2a (surface water) and Table 14 (groundwater) of the *Ross River Basin and Magnetic Island Environmental Vales and Water Quality Objectives Basin No. 118 including all waters of the Ross River Basin, and adjacent coastal waters (including Magnetic island)*, to support the EVs for waters identified in Table 1a.

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C. Reviews and appeals

The provisions regarding reviews of decisions and appeals are found in sections 519 to 539 of the Act.

A person who is dissatisfied with an original decision made by the Department of Environment, Science and Innovation (the department) may apply to have that decision internally reviewed.

Information about initiating an appeal in relation to this notice is contained within the [Internal Reviews and Appeals Information Sheet](#) (available at www.qld.gov.au using the publication number ESR/2015/1742 as a search term).

A request for review or appeal is to be made using the approved form '[Application for review of original decision](#)' (available at www.qld.gov.au using the publication number ESR/2015/1573 as a search term).

Applications for reviews are to be sent to Permit and Licence Management, Department of Environment, Science and Innovation: via email at palm@des.qld.gov.au, or by mail to the following address: GPO. Box 2454, Brisbane, QLD, 4001.

Where an application has been made for a decision to be reviewed, the applicant may also apply to the relevant court for a stay of the decision to secure the effectiveness of the review.

Once the original decision has been reviewed, a person who is dissatisfied with the review decision may be able to appeal against that decision to the relevant court within 22 business days after receiving notice of the review decision.

A person whose interests are or would be adversely affected by a decision of the department may be able to request a statement of reasons for a decision or a statutory order review under the *Judicial Review Act 1991*.

You may have other legal rights or obligations and should seek your own legal advice.

D. Public Register

Pursuant to section 540 of the Act, the department is required to maintain a register of certain documents and information authorised under the Act. A copy of this document will be kept on the public register. The register is available for inspection by members of the public who are able take extracts, or copies of the documents from the register. Documents that are required to be kept on the register are published in their entirety, unless alteration is required by the Act. There is no general discretion allowing the department to withhold documents or information required to be kept on the public register. For more information on the department's public register, search 'public register' at www.qld.gov.au. For queries about privacy matters please email privacy@des.qld.gov.au or telephone 13 74 68.

E. Penalty

It is important that you know the impact to you personally as an individual or as a corporation for not meeting your obligations.


Under section 326D of the Act, failure to comply with a notice to conduct or commission an environmental investigation is an offence.

- The maximum penalty for failing to comply with a notice to conduct or commission an environmental investigation is 300 penalty units, totalling \$ 232,200 for a corporation.

Section 3 of the *Penalties and Sentences Regulation 2015* prescribes the monetary value of a penalty unit.

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Should you have any queries in relation to this notice, please contact Stephanie Brown of the department on telephone number 07 4722 5305.



Signature

26/04/2024

Date

James Sadler
Compliance Delivery Manager
Department of Environment, Science and
Innovation
Delegate of the Chief Executive
Environmental Protection Act 1994

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